UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/565,302 | 01/20/2006 | Akinori Sudoh | Q76805 | 7084 |

23373 7590 11/25/2011

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

| EXAMINER | |
|---|---|
| BARROW, AMANDA J | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1729 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 11/25/2011 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO@sughrue.com
sughrue@sughrue.com
PPROCESSING@SUGHRUE.COM

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/565,302 | SUDOH ET AL. | |
| | Examiner | Art Unit | |
| | AMANDA BARROW | 1729 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 October 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

5)☒ Claim(s) *1-9 and 18-45* is/are pending in the application.

5a) Of the above claim(s) *18-29,35-37,39 and 40* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-9,30-34,38 and 41-45* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/22/2011*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/24/2011 has been entered.

2. The texts of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on 8/19/2009.

### *Claim Rejections - 35 USC § 103*

3. The rejection under 35 U.S.C. 103(a) as being unpatentable over Ochoa et al. (US 2003/0099883 A1) on claims 1, 5, 6, 8, 30-33, 38 and 42 is withdrawn. All rejections pending from this are also withdrawn due to the dependency nature of the claims on independent claim 1.

4. The rejection under 35 U.S.C. 103(a) as being unpatentable over Frysz et al.: "Carbon filaments as a conductive additive to the manganese dioxide cathode of a lithium electrolytic cell;" Journal of Power Sources; vol. 58; 1996; pp. 41-54, in view of Nishimura et al. (EP 1,191,131) on claims 1, 3, 5, 6 and 30-34 is withdrawn. All rejections pending from this are also withdrawn due to the dependency nature of the claims on independent claim 1.

5. The rejection under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. (EP 1,191,131) in view of Ochoa et al. (US 2003/0099883 A1) on claims 1, 2, 4-9, 30, 32-34, 38, 42 and 43 is withdrawn. All rejections pending from this are also withdrawn due to the dependency nature of the claims on independent claim 1.

6. Claims 1, 2, 4-9, 30, 32-34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loch (US 6,171,723) in view of Nishimura et al. (EP 1,191,131).

Regarding claim 1, Loch discloses rechargeable batteries with porous components, and specifically teaches an anode ("high-density electrode") including about 60-94% by weight particles which comprise an anode active material ("electrode active substance"), the anode active material being graphitic carbon, and greater than 1 percent by weight electrically conductive particles which are chemically distinct from the anode active material (column 1, lines 11-13; column 2, lines 17-30; column 5, lines 41-46). The preferred conductive particles include carbon including carbon fibers, the anode comprising between 2-10 % by weight of these conductive particles (column 6, lines 54-64). Furthermore, the electrode has a void volume from about 10-50% (column 6, lines 1-5).

In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. See MPEP 2144.05. Thus, a prima facie case of obviousness exists for the amount of carbon fibers, as the taught range of 2-10% overlaps with 5% or less as claimed. A prima facie case of obviousness also exists for the porosity of the electrode, as the taught range of 10-50% overlaps with 25% or less.

Thus, Loch discloses all of the claimed limitations except for the diameter of the carbon fiber being 1-1,000 nm; however, Nishimura discloses analogous art of a negative electrode comprising graphite as the active material for secondary batteries, the electrodes being incorporated with fine carbon fibers to improve the charge-discharge capacity and mechanical strength of the electrode (paragraph 2; Example 8). Nishimura discloses that the carbon fiber diameter is preferably 0.01-1 μm (i.e., 100-1000 nm), and that a fiber diameter of less than 0.1 μm (100 nm) induces poor mechanical strength and the function as a fiber is easily lost, while a carbon fibers having a diameter in excess of 1 μm (1000 nm) do not easily enter into interparticle spaces of graphite particles contained as an electrode and the productivity of the fibers decreases considerably to thereby disadvantageously induce an increase in production cost (paragraphs 31 & 32).

Therefore, it would have been obvious to one of ordinary skill in the art to utilize carbon fibers having a particle diameter rane of 1-1,000 nm in the anode of Loch because Nishimura discloses that when carbon fibers are incorporated into an electrode such as an anode containing graphite, the carbon fibers prefereably have a diameter of 0.01-1 μm (i.e., 100-1000 nm) because a a fiber diameter of less than 0.1 μm (100 nm) induces poor mechanical strength and the function as a fiber is easily lost, while a carbon fibers having a diameter in excess of 1 μm (1000 nm) do not easily enter into interparticle spaces of graphite particles contained as an electrode and the productivity of the fibers decreases considerably to thereby disadvantageously induce an increase in production cost (paragraphs 31 & 32).

Regarding claims 2, 4 and 6-9, Loch discloses that the preferred conductive particles include carbon including carbon fibers, the anode comprising between 2-10 % by weight of these

conductive particles (column 6, lines 54-64), but is silent as to any other properties of the carbon fibers; however, Nishimura discloses analogous art of a negative electrode comprising graphite as the active material for secondary batteries, the electrodes being incorporated with fine carbon fibers to improve the charge-discharge capacity and mechanical strength of the electrode (paragraph 2; Example 8). Nishimura discloses the properties of the carbon fibers including that the fibers have undergone a heat treatment of 2000° C or higher resulting in a highly crystalline carbon fiber, i.e., a graphite carbon fiber (paragraphs 23 and 25); the carbon fiber contains boron in an amount of 0.1-10 mass%, i.e., 1000-100,000 ppm (paragraph 23); the carbon fibers have an aspect ratio of 10 or more (paragraph 23), and more preferably 50 or more (paragraph 31); the crystalline carbon fiber has an interlayer distance $d_{002}$ between carbon layers as determined by x-ray diffraction method in a range of 0.335-0.342 (page 3, lines 57-58); the carbon fibers produced include expanded carbon fibers and other fibrous carbons (paragraph 2) in which boron crystals are contained within the fibers (paragraph 23) (i.e., an "interior hollow structure"); and further, the carbon fiber may be a branched carbon fiber (abstract; paragraphs 2 and 42).

Therefore, it would have been obvious to one of ordinary skill in the art to utilize Nishimura's carbon fibers with the aforementioned properties because Nishimura teaches that the carbon fibers improve the charge-discharge capacity and mechanical strength of the electrode (paragraph 2). Furthermore, the selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07).

Regarding claim 5, Loch discloses the preferred conductive particles include carbon including carbon fibers, the anode comprising between 2-10 % by weight of these conductive particles (column 6, lines 54-64). Thus, a prima facie case of obviousness exists for the amount of carbon fibers, as the taught range of 2-10% overlaps with 0.05- 5% as claimed.

Regarding claim 30, modified Loch discloses the capacities of the produced anodes in Figures 8-11 which all illustrate the capacity density of all anodes produced to be higher than 100 mAh/g as claimed.

Regarding claims 32 and 33, Loch discloses the electrode is for a rechargeable, i.e., secondary, battery (column 1, lines 11-13; Examples 19-23 disclosing the laminated secondary batteries).

Regarding claim 34, Loch discloses the electrolyte may be a liquid comprising a mixture of ethylene carbonate and diethyl carbonate (column 26, lines 64-67).

Regarding claim 38, Loch discloses the electrode active substance may be graphitic carbon (column 5, lines 41-46).

7. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loch (US 6,171,723) in view of Nishimura et al. (EP 1,191,131) as applied to claims 1, 2, 4-9, 30, 32-34 and 38 above, and further in view of Frysz et al.: "Carbon filaments as a conductive additive to the manganese dioxide cathode of a lithium electrolytic cell; "Journal of Power Sources; vol. 58; 1996; pp. 41-54.

Regarding claim 3, Loch fails to disclose that the carbon fiber is a grahitic carbon fiber having an oxygen-containing functional groups introduced to the surface of said carbon fibers;

however Frysz discloses analogous art of the addition of carbon filaments to electrodes (abstract), and that the carbon fibers are treated by pluronic surfactant ("oxidation treatment") to introduce hydroxyl groups to the surface of the fibers ("oxygen-containing functional group") (pg. 42, second column, last paragraph), and that almost 80 mAh/g active material more capacity was achieved with surfactant treatment of the filaments (pg. 47, column 2, first paragraph). Frysz also discloses that the packing density and electron transfer rate are enhanced by surface treatment of the carbon (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the carbon fibers of Loch to have oxygen-containing functional groups because Fyrsz discloses carbon fibers having oxygen-containing surface groups and that this results in an increased capacity, enhanced packing density and a better electron transfer rate (pg. 47, column 2, first paragraph; abstract).

8. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loch (US 6,171,723) in view of Nishimura et al. (EP 1,191,131) as applied to claims 1, 2, 4-9, 30, 32-34 and 38 above, or alternatively under 35 U.S.C. 103(a) as being unpatentable over Loch (US 6,171,723) in view of Nishimura et al. (EP 1,191,131) and Frysz et al.: "Carbon filaments as a conductive additive to the manganese dioxide cathode of a lithium electrolytic cell;" Journal of Power Sources; vol. 58; 1996; pp. 41-54.

Regarding claim 31, given that the electrode of modified Loch contains all of the claimed constituents in the amounts claimed, the electrode would inherently absorb 3 μl of propylene carbonate within 500 seconds at 25°C and 1 atm. A reference which is silent about a claimed

invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999).

Alternatively, Frysz discloses analogous art of the addition of carbon filaments to electrodes (abstract), and that the main factors related to high capacity in an electrode are electrode electrolyte absorptivitiy and electrolyte absorption rate (pg. 47, column 2, first paragraph). Frysz further discloses that the primary factor relating to this is the shape of the carbon filaments with the high aspect ratio which produces a channel-like pore structure within the cathode which facilitates flowability of electrolyte into the cathode. This easier flow of electrolyte allows a larger quantity of electrolyte to be held by the cathode and the rate of adsorption of the electrolyte into the cathode to be higher. The availability of electrolyte to promote ionic conduction and the ability of the carbon filament to rapidly transfer electrons decrease the degree and rate of polarization, thereby extending the useable life of the cathode and yielding a discharge curve with a gently sloping end-of-life (pg. 52, first column, first paragraph).

Therefore, it would have been obvious to a person of ordinary skill in the art to optimize the absorptivity rate of electrolyte of Loch's electrode because Frysz discloses that the absorptivity rate of electrolyte is a main factor in creating a high capacity electrode (pg. 47, column 2, first paragraph; pg. 52, first column, first paragraph). The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05, II.).

9. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loch (US 6,171,723) in view of Nishimura et al. (EP 1,191,131) as applied to claims 1, 2, 4-9, 30, 32-34 and 38 above, and further in view of Kubota et al. (US 6,139,990).

Regarding claim 41, Loch discloses the electrode active substance may be graphitic carbon (column 5, lines 41-46), that the preferred particle size is between 0.1-10 μm (column 6, lines 40-42), and that the active substance is 60-94 wt% (column 2, lines 22-30). Loch fails to disclose the average roundness of the particles; however, Kubota discloses analogous art of modified graphite particles and there use in secondary batteries as a negative electrode material which have a degree of circularity of not less than 0.86 resulting in a decrease in discharge capacity at high discharge current values (abstract; column 6, lines 55-67).

Therefore, it would have been obvious to a person of ordinary skill in the art to modify the graphite particles used in Loch to have a degree of circularity of not less than 0.86 because Kubota teaches that the use of graphite particles with this parameter in an electrode of a battery results in a decrease in discharge capacity at high discharge current values (abstract; column 6, lines 55-67).

10. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loch (US 6,171,723) in view of Nishimura et al. (EP 1,191,131) as applied to claims 1, 2, 4-9, 30, 32-34 and 38 above, and further in view of Hiroshi (JP 10-261406).

Regarding claim 42, Loch discloses the electrode active substance may be graphitic carbon in the amount of 60-94 wt% (column 2, lines 22-30), but is silent as to the bulk density of the electrode; however, Hiroshi discloses analogous art of a negative electrode comprising

carbon fiber and graphitic carbon and teaches that the packing density (i.e. "bulk density") of the electrode is preferably 1.3-1.8 g/cm$^3$, and that if the packing density is less than 1.3 g/cm$^3$, the resistance of the anode will be high, and if the packing density exceeds 1.8 g/cm$^3$, the permeability of the electrolysis solution will decrease which will raise the resistance of the anode (abstract; paragraph 22).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the anode of Loch to have a packing/bulk density between 1.3-1.8 g/cm$^3$ because Hiroshi teaches an analogous negative electrode comprising carbon fiber and graphitic carbon and that if the packing density is less than 1.3 g/cm$^3$, the resistance of the anode will be high, and if the packing density exceeds 1.8 g/cm$^3$, the permeability of the electrolysis solution will decrease which will raise the resistance of the anode (abstract; paragraph 22).

11. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loch (US 6,171,723) in view of Nishimura et al. (EP 1,191,131) and Hiroshi (JP 10-261406) as applied to claim 42 above, and further in view of Cho et al. (US 2003/0049529).

Regarding claim 43, Loch fails to disclose that the graphite material contains boron; however, Cho discloses analogous art of an active material for a negative electrode and teaches that boron-coated graphite, where boron is added to the carbon-based material, is a high capacity negative active material (paragraph 10).

Therefore, it would have been obvious to one of ordinary skill in the art to utilize a boron-coated graphite material as the negative electrode material in Loch's anode because Cho discloses that boron-coated graphite is a high capacity negative active material (paragraph 10). Furthermore, the selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07).

12. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loch (US 6,171,723) in view of Nishimura et al. (EP 1,191,131) and Hiroshi (JP 10-261406) as applied to claim 42 above, and further in view of Kubota et al. (US 6,139,990).

Regarding claim 44, Loch discloses the electrode active substance may be graphitic carbon (column 5, lines 41-46), that the preferred particle size is between 0.1-10 μm (column 6, lines 40-42), and that the active substance is 60-94 wt% (column 2, lines 22-30). Loch fails to disclose the average roundness of the particles; however, Kubota discloses analogous art of modified graphite particles and there use in secondary batteries as a negative electrode material which have a degree of circularity of not less than 0.86 resulting in a decrease in discharge capacity at high discharge current values (abstract; column 6, lines 55-67).

Therefore, it would have been obvious to a person of ordinary skill in the art to modify the graphite particles used in Loch to have a degree of circularity of not less than 0.86 because Kubota teaches that the use of graphite particles with this parameter in an electrode of a battery results in a decrease in discharge capacity at high discharge current values (abstract; column 6, lines 55-67).

13. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loch (US 6,171,723) in view of Nishimura et al. (EP 1,191,131) and Hiroshi (JP 10-261406) as applied to claim 42 above, and further in view of Kitagawa et al. (US 2002/0061445).

Regarding claim 45, Loch discloses the electrode active substance may be graphitic carbon in the amount of 60-94 wt% (column 2, lines 22-30), but is silent as to the graphite particles $C_0$ of a 002 plane, La, Lc, BET specific surface area, true density and laser Raman R values; however, Kitagawa discloses a secondary cell utilizing a battery in which the graphite powder has a Lc of at least 1000 angstroms (100 nm) or more (paragraph 13); has a Raman R , that is the peak intensity of 1360 $cm^{-1}$ in relation to the peak intensity of 1580 $cm^{-1}$ of 0.3 or less (paragraph 14); a BET specific surface area of 3.5 $m^2/g$ or more and not exceeding 10 $m^2/g$ (paragraph 14); a mean particle size of 10-30 microns (paragraph 15) and a mean roundness ranging from 0.918-0.966 (Table 1). Kitagawa is silent as to the $C_0$, La and true density of the graphite; however, given the other five parameters of the graphite claimed are matched by Kitagawa, it is the position of the Examiner that the graphite material used in Kitagawa is nearly identical to that claimed and would have the values falling within the claimed ranges for $C_0$, La and true density. A reference which is silent about a claimed invention's features is inherently

anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999).

Furthermore, Kitagawa discloses that the graphite material for a negative electrode achieves at least 95% of the theoretical value of specific capacity, while its irreversible capacity is extremely small, by which it contributes to the enhancement of energy density (paragraph 89). Moreover, the graphite material provides not only excellent high rate charge and discharge performances and low temperature high rate discharge performance, but presents a highly reliable battery which is free from electrolyte accident even left at a high temperature (paragraph 89).

Therefore, it would have been obvious to use the graphite of Kitagawa with the specific parameters disclosed as the graphite material of Loch because Kitagawa teaches that the graphite material achieves at least 95% of the theoretical value of specific capacity, has an extremely small irreversible capacity by which it contributes to the enhancement of energy density, has an excellent high rate charge and discharge performance, low temperature high rate discharge performance, and presents a highly reliable battery which is free from electrolyte accident even left at a high temperature (paragraph 89). Furthermore, the selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07).

***Response to Arguments***

14. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

*Applicant's remaining principal arguments are*

*(a) The prior art does not provide teaching, suggestion and motivation to arrive at the porosity range claimed.*

In response to Applicant's arguments, please consider the following comments.

(a) It is the practice of the Office to rely on the best prior art references in rejecting a claim, and also to avoid cumulative rejections, i.e., those which would clearly fall if the primary rejection were not sustained (see MPEP 706.02). The Examiner updated her search in regards to Applicant's porosity arguments and found better prior art in Loch (US 6,171,723); thus, the best prior art has been applied to the claim and the cumulative rejections (i.e., those withdrawn in this Office Action), have been withdrawn.

***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: ***JP 2000-195550*** (indicated by the foreign searching authority and listed on the IDS submitted by Applicant on 1/20/2006) teaches a secondary battery with a positive electrode having a void ratio (i.e., porosity) of 22% or less and a negative electrode having a void ratio of 31% or less in order to balance the demands of cell capacity, battery size, and capacity/ permeability of the non-aqueous electrolyte within the electrodes (abstract, paragraphs 4 & 5).

***JP 11-329433*** (also indiciated by the FSA and listed on the IDS of 1/20/2006) teaches an electrode having a porosity of 15-60% (abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMANDA BARROW whose telephone number is (571)270-7867. The examiner can normally be reached on 7:30am-5pm EST. Monday-Friday, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on 571-272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AMANDA BARROW/
Examiner, Art Unit 1729

/ULA C. RUDDOCK/
Supervisory Patent Examiner, Art Unit 1729